Author Index

Aiba, S.: See Imanaka, T.

Alroy, T. and Tannenbaum, S. R.: Considerations in Predicting Phenotypic Modifications in Amino Acid Profiles of Total Cell Protein of Microorganisms, 1145; *Erratum*, 1899

—— and ——: Modifications in Amino Acid Profiles of Cell Residues of *Candida utilis* and *Enterobacter aerogenes*, 1155

Anderson, A. W.: See Grant, G. A.

Aris, R. and Humphrey, A. E.: Dynamics of a Chemostat in which Two Organisms Compete for a Common Substrate, 1375

Atkinson, B., Rott, J., and Rousseau, I.: Characteristics of Unbuffered Gel-Immobilized Urease Particles. I. Internal pH, 1037

—— and Rousseau, I.: Characteristics of Unbuffered Gel-Immobilized Urease Particles. II. Overall Rate of Reaction, 1065

Bailey, J. E.: See Cho, Y. K.

Bajpai, R. K., Ramkrishna, D., and Prokop, A.: Effects of Drop Interactions on the Performance of Hydrocarbon Fermentors, 1761

——: See Ghose, T. K.

Barral, M. F.: See Taralli, G.

Bencivengo, M.: See O'Leary, V. S.

Beneš, P.: See Linek, V.

Berezin, I. V.: See Klibanov, A. M.

Bhargava, R.: See Ghose, T. K.

Bhattacharya, P.: See Mukherjea, R. N.

Bijkerk, A. H. E. and Hall, R. J.: A Mechanistic Model of the Aerobic Growth of *Saccharomyces cerevisiae*, 267

Blanch, H. W.: See Mallee, F. M.

——: See Yoon, H.

——: See Ziegler, H.

Bolt, K.: See Spier, R. E.

Borzani, W.: An Empirical Equation for Evaluation of Specific Interfacial Area in Hydrocarbon–Water Agitated Systems, 439

——, Gregori, R. E., and Vairo, M. L. R.: Some Observations on Oscillatory Changes in the Growth Rate of *Saccharomyces cerevisiae* in Aerobic Continuous Undisturbed Culture, 1363

——: See Vairo, M. L. R.

Bourne, J. R.: See Stravs, A.

Boyles, D. T.: A Rapid Method for Measuring Specific Growth Rate of Microorganisms, 297

Brillouet, J.-M., Coulet, P. R., and Gautheron, D. C.: Chemically Activated Collagen for Amyloglucosidase Attachment. Use in a Helicoidal Reactor, 125

Brown, D. E. and Zainudeen, M. A.: Growth Kinetics and Cellulase Biosynthesis in the Continuous Culture of *Trichoderma viride*, 941

Bucke, C.: See Kierstan, M.

Bull, A. T.: See Rowley, B. I.

Butler, L.: A Suggested Approach to ATP Regeneration for Enzyme Technology Applications, 591

Chahal, D. S.: See Moo-Young, M.

Chang, H. N. and Reilly, P. J.: Immobilization and Characterization of Hog Kidney Mutarotase, 923

Chen, A. K. and Liu, C. C.: Electrochemical Evaluation of Lactate Dehydrogenase Immobilized in Polyacrylamide Gels, 1785

Chen, B. J.: See Lim, H. C.

Chen, L. F.: See Dickensheets, P. A.

Cheryan, M.: See Taylor, M. J.

Chiang, L. C. and Dunlap, C. E.: A Method Using Solubility to Predict Dry Matter Digestibility of Cellulosic Materials, 143
Chibata, I.: See Yamamoto, K.
Cho, Y. K. and Bailey, J. E.: The Influence of Peroxide-Stabilizing Agents on Enzyme Deactivation by H_2O_2, 157
—— and ——: Glucoamylase and Glucose Oxidase Preparations and Their Combined Application for Conversion of Maltose to Gluconic Acid, 185
—— and ——: Enzyme Immobilization on Activated Carbon: Alleviation of Enzyme Deactivation by Hydrogen Peroxide, 769
Chung, S. H.: See Ryu, D. Y.
Cinq-Mars, G. V. and Howell, J.: Enzymatic Treatment of Primary Municipal Sludge with *Trichoderma viride* Cellulase, 377
Cobb, J. T.: See Madgavkar, A. M.
Cooney, C. L., Wang, H. Y., and Wang, D. I. C.: Computer-Aided Material Balancing for Prediction of Fermentation Parameters, 55
——: See Wang, H. Y.
Cooney, D. O.: See Van Dongen, D. B.
Cordier, D.: See Grasset, L.
Coughlin, R. W.: See Wallace, T. C.
Coulet, P. R.: See Brillouet, J.-M.
Creagan, C. C.: See Lim, H. C.
Cysewski, G. R. and Wilke, C. R.: Rapid Ethanol Fermentations Using Vacuum and Cell Recycle, 1125

Dang, N. D. P., Karrer, D. A., and Dunn, I. J.: Oxygen Transfer Coefficients by Dynamic Model Moment Analysis, 853
De Arauzo, E. H.: See Taralli, G.
Der Yang, R.: See Von Stockar, U.
De Souza, M. E.: See Taralli, G.
Dickensheets, P. A., Chen, L. F., and Tsao, G. T.: Characteristics of Yeast Invertase Immobilized on Porous Cellulose Beads, 365
Dos Anjos Magalhães, M.: See Vairo, M. L. R.
Doulah, M. S.: Mechanism of Disintegration of Biological Cells in Ultrasonic Cavitation, 649
Driessen, F. M., Ubbels, J., and Stadhouders, J.: Continuous Manufacture of Yogurt. I. Optimal Conditions and Kinetics of the Prefermentation Process, 821
——, ——, and ——: Continuous Manufacture of Yogurt. II. Procedure and Apparatus for Continuous Coagulation, 841
Dunlap, C. E.: See Chiang, L. C.
Dunn, I. J.: See Dang, N. D. P.
——: See Ziegler, H.
Dunnill, P.: See Munro, P. A.

Emery, A.: See Swanson, S. J.
Erickson, L. E.: See Gutierrez, J. R.
——: See Hsu, K. H.
——: See MacLean, G. T.
——: See Nakahara, T.

Fan, L. T.: See Hsu, K. H.
——: See MacLean, G. T.
Fencl, Z.: See Hunková, Z.
Fink, D. J.: Enhancement of Oxidase Reactor Productivity, 1245
Finley, J. W., Stanley, W. L., and Watters, G. G.: Removal of Chill Haze from Beer with Papain Immobilized on Chitin, 1895
Finn, R. K.: See Ramalingham, A.
Fleenor, M. B.: See Srinivasan, V. R.
Flynn, A.: See Kelly, N.

Gaudy, A. F., Jr., Goswami, S. R., Manickam, T., and Gaudy, E.: Formation of Strippable Metabolic Products in Biological Waste Treatment, 1239
Gaudy, E.: See Gaudy, A. F., Jr.
Gautheron, D. C.: See Brillouet, J.-M.
Gerson, D. F.: See Zajic, J. E.
Ghose, T. K., Bhargava, R., and Bajpai, R. K.: Purification of Sugars through Microbial Rejection, 605
Ghosh, B. K.: See Mukherjea, R. N.
Gong, C.-S., Ladisch, M. R., and Tsao, G. T.: Cellobiase from *Trichoderma viride*: Purification, Properties, Kinetics, and Mechanism, 959

Goswami, S. R.: See Gaudy, A. F., Jr.
Grant, G. A., Anderson, A. W., and Han, Y. W.: Preliminary Cost Estimates for Commercial Fermentation of Straw as Animal Feed, 1817
Grasset, L., Cordier, D., and Ville, A.: Woven Silk as a Carrier for the Immobilization of Enzymes, 611
Gray, C. H. and Livingstone, C. M.: Properties of Enzymes Immobilized by the Diazotized *m*-Diaminobenzene Method, 349
Gray, P. P.: See Whaite, P.
Green, R.: See O'Leary, V. S.
Gregori, R. E.: See Borzani, W.
Grégr, V.: See Páca, J.
Guay, R., Silver, M., and Torma, A. E.: Ferrous Iron Oxidation and Uranium Extraction by *Thiobacillus ferrooxidans*, 727
Guignard, H.: See Zajic, J. E.
Gutierrez, J. R. and Erickson, L. E.: Hydrocarbon Uptake in Hydrocarbon Fermentations, 1331
——: See Nakahara, T.

Hall, R. J.: See Bijkerk, A. H. E.
Halwachs, W., Wandrey, C., and Schügerl, K.: Application of Immobilized Chymotrypsin in a Multistage Fluidized-Bed Reactor, 1667
Hamada, S-I.: See Miura, Y.
Hamilton, B. K.: See Wang, D. I. C.
Han, Y. W.: See Grant, G. A.
Harper, J. M.: See Nesse, N.
Hassan, I. T. M. and Robinson, C. W.: Oxygen Transfer in Mechanically Agitated Aqueous Systems Containing Dispersed Hydrocarbon, 661
Hirano, K.-I., Karube, I., and Suzuki, S.: Aminoacylase Pellets, 311
——: See Karube, I.
Holdom, R. S.: See Larsen, V. F.
Holsinger, V. H.: See O'Leary, V. S.
Horikoshi, K.: See Nakamura, N.
Howell, J.: See Cinq-Mars, G. V.
Howell, J. A.: See Velicangil, O.
Hsu, K. H., Erickson, L. E., and Fan, L. T.: Pressure Drop, Gas Hold-Up, and Oxygen Transfer in Tower Systems, 247
——: See MacLean, G. T.
Humphrey, A. E.: See Aris, R.
Humphreys, J. D.: See Marshall, J. J.
Hunková, Z. and Fencl, Z.: Toxic Effects of Fatty Acids on Yeast Cells: Dependence of Inhibitory Effects on Fatty Acid Concentration, 1623

Imanaka, T. and Aiba, S.: A Kinetic Model of Catabolite Repression in the Dual Control Mechanism in Microorganisms, 757

Jack, T. R. and Zajic, J. E.: The Enzymatic Conversion of L-Histidine to Urocanic Acid by Whole Cells of *Micrococcus luteus* Immobilized on Carbodiimide Activated Carboxymethylcellulose, 631
Jennings, P. A.: Reply to "Theoretical Model for a Submerged Biological Filter", 1417
Johnson, D. B.: See Flynn, A.
——: See McCarthy, M.
Jüttner, F.: Thirty Liter Tower-Type Pilot Plant for the Mass Cultivation of Light- and Motion-Sensitive Planktonic Algae, 1679

Karrer, D. A.: See Dang, N. D. P.
Karube, I., Hirano, K.-I., and Suzuki, S.: Glucose Oxidase Pellets, 1233
——, Matsunaga, T., Tsuru, S., and Suzuki, S.: Biochemical Fuel Cell Utilizing Immobilized Cells of *Clostridium butyricum*, 1727
——, Suganuma, T., and Suzuki, S.: Bacteriolysis by Immobilized Enzymes, 301
——, Tanaka, S., Shirai, T., and Suzuki, S.: Hydrolysis of Cellulose in a Cellulase-Bead Fluidized Bed Reactor, 1183
——: See Hirano, K.-I.
——: See Nakamoto, Y.
——: See Satoh, I.
Katoh, K.: See Ryu, D. Y.
Keay, L.: The Growth of L-Cells and Vero Cells on an Autoclavable MEM-Peptone Medium, 399

Kelly, N., Flynn, A., and Johnson, D. B.: Preliminary Investigations on the Immobilization of Yeast Alcohol Dehydrogenase, 1211
Kelly, R. M. and Kirwan, D. J.: Electrochemical Regeneration of NAD^+ on Carbon Electrodes, 1215
Keenan, J. D. and Kormi, I.: Methane Fermentation of Brewery By-Products, 867
Kierstan, M. and Bucke, C.: The Immobilization of Microbial Cells, Subcellular Organelles, and Enzymes in Calcium Alginate Gels, 387
Kilara, A., Shahani, K. M., and Wagner, F. W.: Preparation and Properties of Immobilized Papain and Lipase, 1703
Kirwan, D. J.: See Kelly, R. M.
Klibanov, A. M., Samokhin, G. P., Martinek, K., and Berezin, I. V.: A New Mechanochemical Method of Enzyme Immobilization, 211
——, ——, ——, and ——: A New Approach to Preparative Enzymatic Synthesis, 1351
Klinzing, G.: See Yoon, H.
Kormi, I.: See Keenan, J. D.
Korus, R. A. and Olson, A. C.: The Use of α-Galactosidase and Invertase in Hollow Fiber Reactors, 1
Kosaric, N.: See Leduy, A.
Kossen, N. W. F.: See Metz, B.

Ladisch, M. R.: See Gong, C.-S.
Laluce, C. and Molinari, R.: Selection of a Chemically Defined Medium for Submerged Cultivation of *Streptomyces aureofaciens* with High Extracellular Caseinolytic Activity, 1863
Larsen, V. F. and Holdom, R. S.: Automatic Effluent Removal System, 933
Latgé, J.-P., Soper, R. S., and Madore, C. D.: Media Suitable for Industrial Production of *Entomophthora virulenta* Zygospores, 1269
Leduy, A. and Therien, N.: An Improved Method for Optical Density Measurement of the Semimicroscopic Blue Green Alga *Spirulina maxima*, 1219
——, Kosaric, N., and Zajic, J. E.: Transfer Function Matrix of the Continuous Cultivation System of *Morchella crassipes* in Ammonia Base Waste Sulfite Liquor, 1653
Leh, M. B.: See Wallace, T. C.
Lilly, M. D.: See Munro, P. A.
Lim, H. C., Chen, B. J., and Creagan, C. C.: An Analysis of Extended and Exponentially-Fed-Batch Cultures, 425
——: See Swanson, S. J.
Lin, S. H.: See Ngian, K. F.
Lindblom, M.: Properties of Intracellular Ribonuclease Utilized for RNA Reduction in Disintegrated Cells of *Saccharomyces cerevisiae*, 199
Linder, D.: See Wengenmayer, F.
Linek, V. and Beneš, P.: Second Response: Enhancement of Oxygen Absorption in Biological Systems, 565
—— and ——: Multiregion, Multilayer, Nonuniform Diffusion Model of an Oxygen Electrode, 741
—— and Vacek, V.: Dynamic Measurement of the Volumetric Mass Transfer Coefficient in Agitated Vessels: Effect of the Start-Up Period on the Response of an Oxygen Electrode, 983
Liu, C. C.: See Chen, A. K.
Livingston, C. M.: See Gray, C. H.

MacLean, G. T., Erickson, L. E., Hsu, K. H., and Fan, L. T.: Oxygen Transfer and Axial Dispersion in an Aeration Tower Containing Static Mixers, 493
Macy, C.: See Tassinari, T.
Madgavkar, A. M., Shah, Y. T., and Cobb, J. T.: Hydrolysis of Starch in a Membrane Reactor, 1719
Madore, C. D.: See Latgé, J.-P.
Mallee, F. M. and Blanch, H. W.: Mechanistic Model for Microbial Growth of Hydrocarbons, 1793
Mandels, M.: See Peitersen, N.
Manickam, T.: See Gaudy, A. F., Jr.
Märkl, H.: CO_2 Transport and Photosynthetic Productivity of a Continuous Culture of Algae, 1851
Marshall, J. J. and Humphreys, J. D.: Synthesis of a Soluble Catalase–Dextran Conjugate, 1739
Martin, W. B.: See Ngian, K. F.
Martinek, K.: See Klibanov, A. M.

Mattiasson, B.: The Use of Coimmobilized Lysozyme as a Bactericide in Enzyme Columns: A Step Toward the Design of Self-Sterilizing Enzyme Columns, 777

——, Mosbach, K., and Svenson, A.: Application of Cyanide-Metabolizing Enzymes to Environmental Control; Enzyme Thermistor Assay of Cyanide Using Immobilized Rhodanese and Injectase, 1643

Matsunaga, T.: See Karube, I.

McCarthy, M. and Johnson, D. B.: Urate Oxidase Immobilization on Elastin, 599

Medeiros, J.: See Peitersen, N.

Meister, D.: See Ziegler, H.

Merchuk, J. C.: Further Considerations on the Enhancement Factor for Oxygen Absorption into Fermentation Broth, 1885

Metz, B. and Kossen, N. W. F.: The Growth of Molds in the Form of Pellets—A Literature Review (*Biotechnology Review*), 781

Miura, Y., Okazaki, M., Hamada, S-I., Murakawa, S-I., and Yugen, R.: Assimilation of Liquid Hydrocarbon by Microorganisms. I. Mechanism of Hydrocarbon Uptake, 701

——, ——, ——, ——, and Ohno, K.: Assimilation of Liquid Hydrocarbon by Microorganisms. II. Growth Kinetics, 715

—— and Miyamoto, K.: Oxygen Transfer within Fungal Pellets, 1407

Miyamoto, K.: See Miura, Y.

Molinari, R.: See Laluce, C.

Moo-Young, M., Chahal, D. S., Swan, J. E., and Robinson, C. W.: SCP Production by *Chaetomium cellulolyticum*, A New Thermotolerant Cellulolytic Fungus, 527

——: See Wheatley, M. A.

Mosbach, K.: See Mattiasson, B.

Mou, D.-G.: See Wang, H. Y.

Mukherjea, R. N., Bhattacharya, P., Ghosh, B. K., and Taraphdar, D. K.: Process Engineering Studies on Immobilized Trypsin Using Molecular Sieves as Carriers, 1259

Munro, P. A., Dunnill, P., and Lilly, M. D.: Nonporous Magnetic Materials as Enzyme Supports: Studies with Immobilized Chymotrypsin, 101

Murakawa, S-I.: See Miura, Y.

Nakahara, T., Erickson, L. E., and Gutierrez, J. R.: Characteristics of Hydrocarbon Uptake in Cultures with Two Liquid Phases, 9

Nakamoto, Y., Nishida, M., Karube, I., and Suzuki, S.: Photocontrol of Immobilized Trypsin Activity, 1115

Nakamura, N. and Horikoshi, K.: Production of Schardinger β-Dextrin by Soluble and Immobilized Cyclodextrin Glycosyltransferase of an Alkalophilic *Bacillus* sp., 87

Nakano, H., Tomita, F., Yamaguchi, K., Nagashima, M., and Suzuki, T.: Corynecin (Chloramphenicol Analogs) Fermentation Studies: Selective Production of Corynecin I by *Corynebacterium hydrocarboclastus* Grown on Acetate, 1009

Nesse, N., Wallick, J., and Harper, J. M.: Pretreatment of Cellulosic Wastes to Increase Enzyme Reactivity, 323

Ngian, K. F., Lin, S. H., and Martin, W. B.: Effect of Mass Transfer Resistance on the Lineweaver–Burk Plots for Flocculating Microorganisms, 1773

Nihtilä, M. and Virkkunen, J.: Practical Identifiability of Growth and Substrate Consumption Models, 1831

Nishida, M.: See Nakamoto, Y.

Nyholm, N.: Kinetics of Phosphate Limited Algal Growth, 467

Ohno, K.: See Miura, Y.

Okazaki, M.: See Miura, Y.

Oldshue, J. Y.: See Ryu, D. Y.

O'Leary, V. S., Green, R., Sullivan, B. C., and Holsinger, V. H.: Alcohol Production by Selected Yeast Strains in Lactase-Hydrolyzed Acid Whey, 1019

——, Sutton, C., Bencivengo, M., Sullivan, B., and Holsinger, V. H.: Influence of Lactose Hydrolysis and Solids Concentration on Alcohol Production by

Yeast in Acid Whey Ultrafiltrate, 1689
Olson, A. C.: See Korus, R. A.
Olson, N. F.: See Taylor, M. J.
Ottengraf, S. P. P.: Theoretical Model for a Submerged Biological Filter, 1411

Páca, J. and Grégr, V.: Growth Characteristics of *Candida utilis* on Volatile Substrate in a Multistage Tower Fermentor, 539
Peitersen, N.: Continuous Cultivation of *Trichoderma viride* on Cellulose, 337
——, Medeiros, J., and Mandels, M.: Adsorption of *Trichoderma* Cellulase on Cellulose, 1091
Perego, L., Jr.: See Vairo, M. L. R.
Perlman, D.: See Stroshane, R. M.
Popper, K.: See Wick, E.
Prokop, A.: See Bajpai, R. K.
——: See Votruba, J.

Ramalingham, A. and Finn, R. K.: The Vacuferm Process: A New Approach to Fermentation Alcohol, 583
Ramkrishna, D.: See Bajpai, R. K.
Reilly, P. J.: See Chang, H. N.
Richardson, T.: See Taylor, M. J.
Robinson, C. W.: See Hassan, I. T. M.
——: See Moo-Young, M.
Rott, J.: See Atkinson, B.
Rousseau, I.: See Atkinson, B.
Rowley, B. I. and Bull, A. T.: Isolation of a Yeast-Lyzing *Arthrobacter* Species and the Production of the Lytic Enzyme Complex in Batch and Continuous-Flow Fermentors, 879
Russell, R. M.: See Tanner, R. D.
Russell, T. W. F.: See Ziegler, H.
Ryu, D. Y. and Oldshue, J. Y.: A Reassessment of Mixing Cost in Fermentation Processes, 621
——, Chung, S.H., and Katoh, K.: Performance of the Continuous Glucose Isomerase Reactor System for the Production of Fructose Syrup, 159

Samokhin, G. P.: See Klibanov, A. M.
Satoh, I., Karube, I., and Suzuki, S.: Enzyme Electrode for Free Cholesterol, 1095
Schlegel, H. G.: Aeration without Air: Oxygen Supply by Hydrogen Peroxide, 413
Schügerl, K.: See Halwachs, W.
Shah, Y. T.: See Madgavkar, A. M.
Shahani, K. M.: See Kilara, A.
Shirai, T.: See Karube, I.
Silver, M.: See Guay, R.
Sobotka, M.: See Votruba, J.
Soper, R. S.: See Latgé, J.-P.
Souki, N. T.: See Tanner, R. D.
Spier, R. E.: Determination of the Time to Harvest Foot-and-Mouth Disease Virus Cultures by Measurements of the Supernatant Concentration of Lactic Dehydrogenase, 929
——, Whiteside, J. P., and Bolt, K.: Trypsinization of BHK 21 Monolayer Cells Grown in Two Large-Scale Unit Process Systems, 1735
Srinivasan, V. R., Fleenor, M. B., and Summers, R. J.: Gradient-Feed Method of Growing High Cell Density Cultures of *Cellulomonas* in a Bench-Scale Fermentor, 153
Stadhouders, J.: See Driessen, F. M.
Stanley, W. L.: See Finley, J. W.
Stravs, A., Ziegler, H., and Bourne, J. R.: Continuous Culture Using a Predisposed Insoluble Substrate, 765
Stroshane, R. M. and Perlman, D.: Fermentation of Glucose by *Acetobacter melanogenus*, 459
Suganuma, T.: See Karube, I.
Sullivan, B. C.: See O'Leary, V. S.
Summers, R. J.: See Srinivasan, V. R.
Sutton, C.: See O'Leary, V. S.
Suzuki, S.: See Hirano, K.-I.
——: See Karube, I.
——: See Nakamoto, Y.
——: See Nakano, H.
——: See Satoh, I.
Suzuki, T.: See Nakano, H.
Svenson, A.: See Mattiasson, B.
Swan, J. E.: See Moo-Young, M.
Swanson, S. J., Emery, A., and Lim, H. C.: Kinetics of Maltose Hydrolysis by Glucoamylase, 1715
Swartz, J. R.: See Wang, H. Y.

Tanaka, S.: See Karube, I.

Tannenbaum, S. R.: See Alroy, Y.
Tanner, R. D., Souki, N. T., and Russell, R. M.: A Fermentation Process for Producing Both Ethanol and Lysine-Enriched Yeast, 27
Taralli, G., De Souza, M. E., De Arauzo, E. H., and Barral, M. F.: A Semicontinuous Experimental Technique for the Study of the Influence of Mixing Conditions on the Homogeneity of Sewage Sludge, 1087
Taraphdar, D. K.: See Mukherjea, R. N.
Tassinari, T. and Macy, C.: Differential Speed Two Roll Mill Pretreatment of Cellulosic Materials for Enzymatic Hydrolysis, 1321
Taylor, M. J., Cheryan, M., Richardson, T., and Olson, N. F.: Pepsin Immobilized on Inorganic Supports for the Continuous Coagulation of Skim Milk, 683
Therien, N.: See Leduy, A.
Tomita, F.: See Nakano, H.
Torma, A. E.: See Guay, R.
Tosa, T.: See Yamamoto, K.
Tsao, G. T.: Interfacial Oxygen Transfer in Fermentation, 557
——: See Dickensheets, P. A.
——: See Gong, C.-S.
Tsuru, S.: See Karube, I.

Ubbels, J.: See Driessen, F. M.

Vacek, V.: See Linek, V.
Vairo, M. L. R., Borzani, W., Dos Anjos Magalhães, M. M., and Perego, L., Jr.: Response of a Continuous Anaerobic Culture to Variations in the Feeding Rate, 595
——: See Borzani, W.
Van Dongen, D. B. and Cooney, D. O.: Hydrolysis of Salicin by β-Glucosidase in a Hollow Fiber Reactor, 1253
Velicangil, O. and Howell, J. A.: Protease-Coupled Membranes for Ultrafiltration, 1891
Venardos, D.: pH-Activity Response for Immobilized β-Glucosidase, 1405
Ville, A.: See Grasset, L.
Virkkunen, J.: See Nihtilä, M.
Von Stockar, U., Der Yang, R., and Wilke, C. R.: Computation of the Fraction of Induced Cells in Enzyme Induction Systems, 445
Votruba, J., Sobotka, M., and Prokop, A.: The Effect of Air Hold-Up on Readings of Dissolved Oxygen Probes, 435

Wallace, T. C., Leh, M. B., and Coughlin, R. W.: Amperometric Assay of Coenzyme-Dependent Oxidoreductase Enzymes in a Flow-Through Cell, 901
Wallenfels, K.: See Wengenmayer, F.
Wallick, J.: See Nesse, N.
Wandrey, C.: See Halwachs, W.
Wang, D. I. C. and Hamilton, B. K.: Kinetics of the Enzymatic Synthesis of Peptide Antibiotics, 1225
——: See Cooney, C. L.
——: See Wang, H. Y.
Wang, H. Y., Cooney, C. L., and Wang, D. I. C.: Computer-Aided Baker's Yeast Fermentations, 69
——, Mou, D.-G., and Swartz, J. R.: Thermodynamic Evaluation of Microbial Growth (*Erratum*), 937
——: See Cooney, C. L.
Watters, G. G.: See Finley, J. W.
Wengenmayer, F., Linder, D., and Wallenfels, K.: 1,4-α-Glucan Phosphorylase from *Klebsiella pneumoniae* Covalently Coupled on Porous Glass, 1387
Whaite, P. and Gray, P. P.: On-Line Computer Optimization of Chemostat Productivity, 575
Wheatley, M. A. and Moo-Young, M.: Degradation of Polysaccharides by Endo- and Exoenzymes: Dextran–Dextranase Model Systems, 219
Whiteside, J. P.: See Spier, R. E.
Wick, E. and Popper, K.: Continuous Fermentation in Slant Tubes, 235
Wilke, C. R.: See Cysewski, G. R.
——: See Von Stockar, U.
Wong, Y. K. and Yang, P. Y.: Effects of Quantitative Shock Loadings on the Constant Recycle Sludge Concentration Activated-Sludge Process, 43

Yagi, H. and Yoshida, F.: Desorption of Carbon Dioxide from Fermentation Broth, 801
——: See Yoshida, F.

Yamada, K.: Recent Advances in Industrial Fermentation in Japan (*Bioengineering Report*), 1563
Yamaguchi, K.: See Nakano, H.
Yamamoto, K., Tosa, T., Yamashita, K., and Chibata, I.: Kinetics and Decay of Fumarase Activity of Immobilized *Brevibacterium ammoniagenes* Cells for Continuous Production of L-Malic Acid, 1101
Yamane, T.: A Proposal for Accurate Determination of "True" Fractional Retention of Enzyme Activity of Immobilization, 749
Yamashita, K.: See Yamamoto, K.
Yang, P. Y.: Biological Kinetic Behaviors and Operational Performances in Aerated and Oxygenated Systems, 1171
——: See Wong, Y. K.
Yoon, H., Klinzing, G., and Blanch, H. W.: Competition for Mixed Substrates by Microbial Populations, 1193
Yoshida, F. and Yagi, H.: First Response: Interfacial Oxygen Transfer, 561
——: See Yagi, H.
Yugen, R.: See Miura, Y.

Zainudeen, M. A.: See Brown, D. E.
Zajic, J. E., Guignard, H., and Gerson, D. F.: Emulsifying and Surface Active Agents from *Corynebacterium hydrocarboclastus*, 1285
——, ——, and ——: Properties and Biodegradation of a Bioemulsifier from *Corynebacterium hydrocarboclastus*, 1303
——: See Jack, T. R.
——: See Leduy, A.
Ziegler, H., Meister, D., Dunn, I. J., Blanch, H. W., and Russell, T. W. F.: The Tubular Loop Fermentor: Oxygen Transfer, Growth Kinetics, and Design, 507
——: See Stravs, A.

Subject Index

Acetobacter melanogenus, glucose fermentation by, 459
Activated sludge process, 43, 1087
  kinetic model, 1431
Aeration (see Oxygen Transfer)
  indirect, 413
  performance, 1171, 1553
Alcohol (see Ethanol)
Alcohol dehydrogenase; yeast, immobilized, 1211
Algae, cultivation of, 1679, 1863
  growth of, 467
  photosynthesis, 1891
Amino acid profiles, microbial protein, 1145, 1155
Aminoacylase, immobilized, 311
Amyloglucosidase, immobilized, 125
Antibiotics, concentration by reverse osmosis, 1419
  peptide, enzymatic synthesis of, 1225
ATP, regeneration of, 591

Bacteriolysis, enzymatic, 301
Beer, chill haze of, 1895
BOD, microbial electrode sensor for, 1535
Brevibacterium ammoniagenes, immobilized, 1101

Calcium alginate, for cell immobilization, 387
Candida utilis, amino acid profiles of, 1145, 1155
  growth in tower fermentor, 539
Carbon, activated, for enzyme immobilization, 769
Carbon dioxide, desorption of, 801
  transport of, 1851
Carboxylmethylcellulose, for cell immobilization, 631
Catalase, immobilized, 1739
Cell disintegration, horizontal mill, 1523
  ultrasonic, 649
Cells, animal (see Tissue Culture)
  immobilized, 387, 631, 1727
Cellobiase, from *Trichoderma viride*, 959
Cellulase, adsorption of, 1091
  immobilized, 1183
  production of, 941
  waste treatment with, 377
Cellulomonas, growth of, 153
Cellulose, digestibility of, 143
  fermentation of, 1817
  for enzyme immobilization, 365, 1463
  hydrolysis, 337, 1183
  pretreatment of, 323, 1321, 1817
Chaetomium cellulolyticium, protein production by, 527
Chitin, for enzyme immobilization, 1895
Chymotrypsin, immobilized, 101, 1667
Clostridium butyricum, immobilized, 1727
Collagen, for enzyme immobilization, 125
Computers, biological process applications, 55, 69
Continuous culture, 235, 337, 595, 765, 941, 1363, 1653, 1851
Corynebacterium hydrocarboclastus, corynecin production by, 1009
  surfactants from, 1285, 1303
Corynecin production, 1009
Cyanide-metabolizing enzymes, 1643
Cyclodextrin glycosyltransferase, immobilized, 87

Dextran, degradation of, 219
  for enzyme immobilization, 1739
Dextranase kinetics, 219
Dextrin, enzymatic production of, 87

Elastin, for enzyme immobilization, 599
Electrodes, BOD, 1535
  enzyme, 1095
  oxygen, 435, 741, 983
Enterobacter aerogenes, amino acid profiles, 1145, 1155
Entomopthora virulenta, zygospore production, 1269
Enzymatic synthesis, 1351

Enzyme electrode, 1095
induction, 445
kinetics (see Kinetics, Enzyme)
Enzyme production, 879, 1863
reactors (see Reactors, Enzyme)
Enzymes, immobilized, 1, 87, 101, 125, 159, 185, 211, 301, 311, 349, 365, 611, 631, 683, 749, 769, 777, 923, 1037, 1065, 1211, 1233, 1259, 1463, 1493, 1549, 1643, 1667, 1703, 1739, 1785, 1891, 1895
activities of, 749, 1115, 1405
deactivation of, 157
inhibition of, 1549
preparation of, 101, 125, 185, 211, 349, 599, 611, 769, 923, 1037, 1233, 1463, 1703, 1739, 1891, 1895
Ethanol production, 27, 583, 1125
from whey, 1019, 1689

Fatty acids, toxic effects on yeast, 1623
Fermentation, in Japan, 1563
Fermentors (see Reactors, Biological process)
Filters, submerged biological, 1411, 1417
Fructose, production, continuous, 159
Fuel cell, biochemical, 1727
Fumarase, of *Brevibacterium ammoniagenes*, 1101

Galactosidase, immobilized, 1
Glass, for enzyme immobilization, 1387
Glucan phosphorylase, immobilized, 1387
Glucoamylase, immobilized, 185
maltose hydrolysis by, 1715
Gluconic acid, production from maltose, 185
Glucose, fermentation of by *Acetobacter melanogenus*, 459
Glucose isomerase, immobilized, 159
Glucose oxidase, immobilized, 185, 1233
Glucosidase, immobilized, 1253, 1405
Growth, algal, measurement of, 1219
phosphate limited, 467
kinetics of, 267, 507, 715, 941
microbial, measurement of, 297, 937
molds, 781
thermodynamic evaluation of, 937
yeast, 267, 539

Hog kidney mutarotase, immobilized, 923
Hollow fiber reactors, 1, 1253
Hydrocarbon fermentations, 9, 701, 715, 1331, 1761, 1793
Hydrocarbon–water systems, 9, 439, 661, 1761
Hydrogen peroxide, enzyme deactivation by, 157
for oxygen supply, 413

Injectase, immobilized, 1643
Invertase, immobilized, 1, 365
Iron oxidation, microbial, 727

Japan, industrial fermentation in, 1563

Kinetics, antibiotic synthesis, 1225
enzyme, 219, 1715
immobilized, 1065
growth, 267, 507, 941, 1793, 1831
hydrocarbon uptake, 701, 715, 1331, 1793
microbial process, 507, 595, 715, 757, 1171, 1193, 1375, 1431, 1773, 1793, 1831
Klebsiella pneumoniae, glucan phosphorylase from, 1387

Lactate dehydrogenase, immobilized, 1785
Lipase, immobilized, 1703
membranes, 1493
Lysozyme, immobilized, 777

Magnetic materials, for enzyme immobilization, 101
Malic acid, continuous production, 1101
Mass transfer, carbon dioxide, 1851
in flocculating microorganisms, 1773
Material balances, computer aided, 55
Methane, from brewery wastes, 867
Microbial processes, batch, 153, 425
continuous, 235, 821, 841, 941, 1653
fed-batch, 425
material balances on, 55, 1449
mixing in, 621
optimization of, 575
Micrococcus luteus, for conversion of histidine to urocanic acid, 631
Milk, continuous coagulation of, 683
Mixed cultures, kinetics of, 1193, 1375
Mixing, costs of, 621

effects on sludge characteristics, 1087
Models, mathematical, activated sludge process, 1431
airlift fermentors, 1503
biological processes, 425,757, 1653, 1761, 1793, 1831
enzymatic processes, 219
yeast growth, 267
Molds, growth of, 781
Molecular sieves, for enzyme immobilization, 1259
Morchella crassipes, cultivation in waste sulfite liquor, 1653

NAD, electrochemical regeneration of, 1215

Optimization, microbial processes, 575
Osmosis, reverse, 1419
Oxidoreductase enzymes, amperometric assay, 901
Oxygen, dissolved, measurement of, 435, 741
Oxygen electrodes, 435, 741, 983
Oxygen supply, from hydrogen peroxide, 413
Oxygen transfer, coefficients, 853, 983
in airlift fermentors, 1503
in fermentation broths, 557, 561, 565, 1885
in fungal pellets, 1407
in hydrocarbon systems, 661
in towers, 247, 493
in tubular fermentors, 507

Papain, immobilized, 1703, 1891, 1895
Penicillin synthesis, yields, 1449
Pepsin, immobilized, 683
Polyacrylamide gels, for enzyme immobilization, 1785
Polysaccharides, enzymatic degradation of, 219
Protein, microbial, 199, 1145, 1155
production of, 527

Reactors, enzyme, 159, 777, 1245
fluid bed, 1183, 1667
helicoidal, 125
hollow fiber, 1, 1253
membrane, 1719
Reactors, microbial process, 879, 933, 1171
airlift, 1503
towers, 247, 493, 539, 1679
tubular loop, 507
Rhodanase, immobilized, 1643
Ribonuclease, intracellular, 199
RNA, reduction of, 199

Saccharomyces cerevisiae, growth of, 1363
growth model, 267
RNA reduction in, 199
Salicin, enzymatic hydrolysis of, 1253
Silk, for enzyme immobilization, 611
Single-cell protein (see Protein, Microbial)
Spirulina maxima, measurement of growth, 1219
Starch, hydrolysis, 1719
Straw, fermentation of, 1817
Streptomyces aureofaciens, enzyme production by, 1863
Sugars, purification of, 605
Surfactants, from *C. hydrocarboclastus*, 1285, 1303

Thiobacillus ferrooxidans, uranium extraction by, 727
Tissue culture processes, 399, 929, 1557, 1735
Tower reactors, 247, 493, 539, 1503, 1679
Trichoderma viride, cultivation on cellulose, 337
cellobiase from, 959
cellulase from, 377, 941
Trypsin, immobilized, 1115, 1259, 1549

Ultrafiltration, membranes for, 1891
Uranium extraction, microbial process for, 727
Urate oxidase, immobilized, 599
Urease, immobilized, 1037, 1065
Urocanic acid, production from histidine, 631

Waste sulfite liquor, cultivation of *M. crassipes* in, 1653
Waste treatment, biological, 43, 1239, 1411, 1417, 1475
enzymatic, 377
Wastes, acid mine, 1475
brewery, 867

cellulosic, 323, 1817
Whey, ethanol production from, 1019, 1689

Yeast, lysine enriched, 27
production, 69
toxic effects of fatty acids on, 1623
Yogurt, production of, 821, 841

Acknowledgment

The Editor and Editorial Board gratefully acknowledge the contributions of the following reviewers during the past year:

S. Aiba
K. Akita
J. F. Andrews
B. Atkinson
J. E. Bailey
G. J. Bartling
W. D. Bellamy
P. Belter
F. R. Bernath
H. W. Blanch
K. B. Bischoff
F. Bissett
D. Brandt
H. R. Bungay, III
R. G. Carbonell
R. E. Chance
E. S. K. Chian
I. Chibata
C. L. Cooney
A. Constantinides
R. W. Coughlin
C. M. Crowe
F. Cunningham
P. S. S. Dawson
A. L. Demain
H. T. Dulmage
D. W. Duncan
C. E. Dunlap
P. Dunnill
L. E. Erickson
E. A. Falch
L. T. Fan
Z. Fencl
D. J. Fink
R. K. Finn
D. S. Flynn
A. G. Fredrickson
E. L. Gaden, Jr.
J. Garibaldi
A. F. Gaudy, Jr.
P. Gerhardt
L. Goldstein
G. Hamer
C. W. Hancher
W. Harder
R. T. Hatch
C.-G. Heden
C. W. Hesseltine
M. Hoare
M. Horisberger
A. E. Humphrey
C. M. Ignoffo
S. Jariwala
N. O. Kapian
L. Keay
D. J. Kirwan
R. A. Korus
C. P. Kurtzman
D. D. Lee
Y. Y. Lee
M. D. Lilly
H. C. Lim
M. Lindblom
V. Linek
J. H. Litchfield
C. F. Macy
H. Maeda
K.-E. Magnusson

M. Mandels
K. Mårtensson
R. I. Mateles
B. Mattiasson
D. L. Miller
D. N. Miller
T. L. Miller
M. Moo-Young
C. B. Muchmore
R. Muzzarelli
W. L. Nyborg
L. K. Nyiri
J. M. Nystrom
D. F. Ollis
A. C. Olson
S. P. P. Ottengraf
J. K. Palmer
E. Papoutsakis
N. Peitersen
D. Perlman
D. D. Perlmutter
J. T. Pfeffer
K. L. Phillips
W. H. Pitcher, Jr.
A. Prokop
P. J. Reilly
C. W. Robinson
P. R. Rony
E. Ross
J. S. Schultz
R. Silman
M. E. Sloćki
K. L. Smiley
G. L. Solomons
G. A. Somkuti
D. Sternberg
J. Studebaker
T.-M. Su
S. R. Tannenbaum
R. D. Tanner
T. H. Tassinari
D. W. Thayer
W. G. Thilly
R. W. Thoma
G. E. Tong
T. Tosa
G. van Dedem
J. P. van Dijken
K. Venkatasubramanian
J. R. Vose
D. I. C. Wang
H. Wang
M. Wayman
H. H. Weetall
M. K. Weibel
C. R. Wilke
J. H. Woychik
P. Y. Yang
R. D. Yang
J. E. Zajic

Biotechnology and Bioengineering

Contents

Volume XIX, 1977

ISSUE NO. 1, JANUARY

R. A. KORUS and A. C. OLSON: The Use of α-Galactosidase and Invertase in Hollow Fiber Reactors 1

T. NAKAHARA, L. E. ERICKSON, and J. R. GUTIERREZ: Characteristics of Hydrocarbon Uptake in Cultures with Two Liquid Phases 9

R. D. TANNER, N. T. SOUKI, and R. M. RUSSELL: A Fermentation Process for Producing Both Ethanol and Lysine-Enriched Yeast 27

Y. K. WONG and P. Y. YANG: Effects of Quantitative Shock Loadings on the Constant Recycle Sludge Concentration Activated-Sludge Process 43

C. L. COONEY, H. Y. WANG, and D. I. C. WANG: Computer-Aided Material Balancing for Prediction of Fermentation Parameters 55

H. Y. WANG, C. L. COONEY, and D. I. C. WANG: Computer-Aided Baker's Yeast Fermentations 69

N. NAKAMURA and K. HORIKOSHI: Production of Schardinger β-Dextrin by Soluble and Immobilized Cyclodextrin Glycosyltransferase of an Alkalophilic *Bacillus* sp. 87

P. A. MUNRO, P. DUNNILL, and M. D. LILLY: Nonporous Magnetic Materials as Enzyme Supports: Studies with Immobilized Chymotrypsin 101

J.-M. BRILLOUET, P. R. COULET, and D. C. GAUTHERON: Chemically Activated Collagen for Amyloglucosidase Attachment. Use in a Helicoidal Reactor 125

L. C. CHIANG and C. E. DUNLAP: A Method Using Solubility to Predict Dry Matter Digestibility of Cellulosic Materials 143

Communications to the Editor

V. R. SRINIVASAN, M. B. FLEENOR, and R. J. SUMMERS: Gradient-Feed Method of Growing High Cell Density Cultures of *Cellulomonas* in a Bench-Scale Fermentor 153

Y. K. CHO and J. E. BAILEY: The Influence of Peroxide-Stabilizing Agents on Enzyme Deactivation by H_2O_2 157

ISSUE. NO. 2, FEBRUARY

D. Y. RYU, S. H. CHUNG, and K. KATOH: Performance of the Continuous Glucose Isomerase Reactor System for the Production of Fructose Syrup 159

Y. K. CHO and J. E. BAILEY: Glucoamylase and Glucose Oxidase Preparations and Their Combined Application for Conversion of Maltose to Gluconic Acid 185

M. LINDBLOM: Properties of Intracellular Ribonuclease Utilized for RNA Reduction in Disintegrated Cells of *Saccharomyces cerevisiae* 199

A. M. KLIBANOV, G. P. SAMOKHIN, K. MARTINEK, and I. V. BEREZIN: A New Mechanochemical Method of Enzyme Immobilization 211

M. A. WHEATLEY and M. MOO-YOUNG: Degradation of Polysaccharides by Endo- and Exoenzymes: Dextran-Dextranase Model Systems 219

E. WICK and K. POPPER: Continuous Fermentation in Slant Tubes 235

K. H. HSU, L. E. ERICKSON, and L. T. FAN: Pressure Drop, Gas Hold-Up, and Oxygen Transfer in Tower Systems 247

A. H. E. BIJKERK and R. J. HALL: A Mechanistic Model of the Aerobic Growth of *Saccharomyces cerevisiae* 267

Communications to the Editor

D. T. BOYLES: A Rapid Method for Measuring Specific Growth Rate of Microorganisms 297

ISSUE NO. 3, MARCH

I. KARUBE, T. SUGANUMA, and S. SUZUKI: Bacteriolysis by Immobilized Enzymes 301

K.-I. HIRANO, I. KARUBE, and S. SUZUKI: Aminoacylase Pellets 311

N. NESSE, J. WALLICK, and J. M. HARPER: Pretreatment of Cellulosic Wastes to Increase Enzyme Reactivity 323

N. PEITERSEN: Continuous Cultivation of *Trichoderma viride* on Cellulose 337

C. H. GRAY and C. M. LIVINGSTONE: Properties of Enzymes Immobilized by the Diazotized *m*-Diaminobenzene Method 349

P. A. DICKENSHEETS, L. F. CHEN and G. T. TSAO: Characteristics of Yeast Invertase Immobilized on Porous Cellulose Beads 365

G. V. CINQ-MARS and J. HOWELL: Enzymatic Treatment of Primary Municipal Sludge with *Trichoderma viride* Cellulase 377

M. KIERSTAN and C. BUCKE: The Immobilization of Microbial Cells, Subcellular Organelles, and Enzymes in Calcium Alginate Gels 387

L. KEAY: The Growth of L-Cells and Vero Cells on an Autoclavable MEM-Peptone Medium 399

H. G. SCHLEGEL: Aeration without Air: Oxygen Supply by Hydrogen Peroxide 413

H. C. LIM, B. J. CHEN, and C. C. CREAGAN: An Analysis of Extended and Exponentially-Fed-Batch Cultures 425

Communications to the Editor

J. VOTRUBA, M. SOBOTKA, and A. PROKOP: The Effect of Air Hold-Up on Readings of Dissolved Oxygen Probes 435

W. BORZANI: An Empirical Equation for Evaluation of Specific Interfacial Area in Hydrocarbon-Water Agitated Systems 439

Information for Contributors 443

ISSUE NO. 4, APRIL

U. VON STOCKAR, R. DER YANG, and C. R. WILKE: Computation of the Fraction of Induced Cells in Enzyme Induction Systems 445

R. M. STROSHANE and D. PERLMAN: Fermentation of Glucose by *Acetobacter melanogenus* 459

N. NYHOLM: Kinetics of Phosphate Limited Algal Growth 467

G. T. MACLEAN, L. E. ERICKSON, K. H. HSU, and L. T. FAN: Oxygen Transfer and Axial Dispersion in an Aeration Tower Containing Static Mixers .. 493

H. ZIEGLER, D. MEISTER, I. J. DUNN, H. W. BLANCH, and T. W. F. RUSSELL: The Tubular Loop Fermentor: Oxygen Transfer, Growth Kinetics, and Design 507

M. MOO-YOUNG, D. S. CHAHAL, J. E. SWAN, and C. W. ROBINSON: SCP Production by *Chaetomium cellulolyticum*, A New Thermotolerant Celulolytic Fungus 527

J. PÁCA and V. GRÉGR: Growth Characteristics of *Candida utilis* on Volatile Substrate in a Multistage Tower Fermentor 539

Communications to the Editor

Editor's Note 555

G. T. TSAO: Interfacial Oxygen Transfer in Fermentation 557

F. YOSHIDA and H. YAGI: First Response: Interfacial Oxygen Transfer .. 561

V. LINEK and P. BENEŠ: Second Response: Enhancement of Oxygen Absorption in Biological Systems 565

P. WHAITE and P. P. GRAY: On-Line Computer Optimization of Chemostat Productivity 575

A. RAMALINGHAM and R. K. FINN: The Vacuferm Process: A New Approach to Fermentation Alcohol 583

L. BUTLER: A Suggested Approach to ATP Regeneration for Enzyme Technology Applications 591

M. L. R. VAIRO, W. BORZANI, M. M. DOS ANJOS MAGALHÃES, and L. PEREGO, JR.: Response of a Continuous Anaerobic Culture to Variations in the Feeding Rate 595

M. MCCARTHY and D. B. JOHNSON: Urate Oxidase Immobilization on Elastin 599

T. K. GHOSE, R. BHARGAVA, and R. K. BAJPAI: Purification of Sugars through Microbial Rejection 605

L. GRASSET, D. CORDIER, and A. VILLE: Woven Silk as a Carrier for the Immobilization of Enzymes 611

Information for Contributors 619

ISSUE NO. 5, MAY

D. Y. RYU and J. Y. OLDSHUE: A Reassessment of Mixing Cost in Fermentation Processes 621

T. R. JACK and J. E. ZAJIC: The Enzymatic Conversion of L-Histidine to Urocanic Acid by Whole Cells of *Micrococcus luteus* Immobilized on Carbodimide Activated Carboxymethylcellulose 631

M. S. DOULAH: Mechanism of Disintegration of Biological Cells in Ultrasonic Cavitation 649

I. T. M. HASSAN and C. W. ROBINSON: Oxygen Transfer in Mechanically Agitated Aqueous Systems Containing Dispersed Hydrocarbon 661

M. J. TAYLOR, M. CHERYAN, T. RICHARDSON, and N. F. OLSON: Pepsin Immobilized on Inorganic Supports for the Continuous Coagulation of Skim Milk 683

Y. MIURA, M. OKAZAKI, S-I. HAMADA, S-I. MURAKAWA and R. YUGEN: Assimilation of Liquid Hydrocarbon by Microorganisms. I. Mechanism of Hydrocarbon Uptake 701

Y. MIURA, M. OKAZAKI, S-I. MURAKAWA, S-I. HAMADA, and K. OHNO: Assimilation of Liquid Hydrocarbon by Microorganisms. II. Growth Kinetics 715

R. GUAY, M. SILVER, and A. E. TORMA: Ferrous Iron Oxidation and Uranium Extraction by *Thiobacillus ferrooxidans* 727

Communications to the Editor

V. LINEK and P. BENEŠ: Multiregion, Multilayer, Nonuniform Diffusion Model of an Oxygen Electrode 741

T. YAMANE: A Proposal for Accurate Determination of "True" Fractional Retention of Enzyme Activity of Immobilization 749

T. IMANAKA and S. AIBA: A Kinetic Model of Catabolite Repression in the Dual Control Mechanism in Microorganisms 757

A. STRAVS, H. ZIEGLER, and J. R. BOURNE: Continuous Culture Using a Predispersed Insoluble Substrate 765

Y. K. CHO and J. E. BAILEY: Enzyme Immobilization on Activated Carbon: Alleviation of Enzyme Deactivation by Hydrogen Peroxide 769

B. MATTIASSON: The Use of Coimmobilized Lysozyme as a Bactericide in Enzyme Columns: A Step Toward the Design of Self-Sterilizing Enzyme Columns 777

ISSUE NO. 6, JUNE

B. METZ and N. W. F. KOSSEN: The Growth of Molds in the Form of Pellets—A Literature Review (*Biotechnology Review*) 781

H. YAGI and F. YOSHIDA: Desorption of Carbon Dioxide from Fermentation Broth 801

F. M. DRIESSEN, J. UBBELS, and J. STADHOUDERS: Continuous Manufacture of Yogurt. I. Optimal Conditions and Kinetics of the Prefermentation Process 821

F. M. DRIESSEN, J. UBBELS, and J. STADHOUDERS: Continuous Manufacture of Yogurt. II. Procedure and Apparatus for Continuous Coagulation .. 841

N. D. P. DANG, D. A. KARRER, and I. J. DUNN: Oxygen Transfer Coefficients by Dynamic Model Moment Analysis 853

J. D. KEENAN and I. KORMI: Methane Fermentation of Brewery By-Products 867

B. I. ROWLEY and A. T. BULL: Isolation of a Yeast-Lyzing *Arthrobacter* Species and the Production of the Lytic Enzyme Complex in Batch and Continuous-Flow Fermentors 879

T. C. WALLACE, M. B. LEH, and R. W. COUGHLIN: Amperometric Assay of Coenzyme-Dependent Oxidoreductase Enzymes in a Flow-Through Cell 901

Communications to the Editor

H. N. CHANG and P. J. REILLY: Immobilization and Characterization of Hog Kidney Mutarotase 923

R. E. SPIER: Determination of the Time to Harvest Foot-and-Mouth Disease Virus Cultures by Measurements of the Supernatant Concentration of Lactic Dehydrogenase 929

V. F. LARSEN and R. S. HOLDOM: Automatic Effluent Removal System ... 933

Erratum

H. Y. WANG, D.-G. MOU, and J. R. SWARTZ: Thermodynamic Evaluation of Microbial Growth 937

Information for Contributors 939

ISSUE NO, 7, JULY

D. E. BROWN and M. A. ZAINUDEEN: Growth Kinetics and Cellulase Biosynthesis in the Continuous Culture of *Trichoderma viride* 941

C.-S. GONG, M. R. LADISCH, and G. T. TSAO: Cellobiase from *Trichoderma viride*: Purification, Properties, Kinetics, and Mechanism 959

V. LINEK and V. VACEK: Dynamic Measurement of the Volumetric Mass Transfer Coefficient in Agitated Vessels: Effect of the Start-Up Period on the Response of an Oxygen Electrode 983

H. NAKANO, F. TOMITA, K. YAMAGUCHI, M. NAGASHIMA, and T. SUZUKI: Corynecin (Chloramphenicol Analogs) Fermentation Studies: Selective Production of Corynecin I by *Corynebacterium hydrocarboclastus* Grown on Acetate 1009

V. S. O'LEARY, R. GREEN, B. C. SULLIVAN, and V. H. HOLSINGER: Alcohol Production by Selected Yeast Strains in Lactase-Hydrolyzed Acid Whey 1019

B. ATKINSON, J. ROTT, and I. ROUSSEAU: Characteristics of Unbuffered Gel-Immobilized Urease Particles. I. Internal pH 1037

B. ATKINSON and I. ROUSSEAU: Characteristics of Unbuffered Gel-Immobilized Urease Particles. II. Overall Rate of Reaction 1065

Communications to the Editor

G. TARALLI, M. E. DE SOUZA, E. H. DE ARAUZO, and M. F. BARRAL: A Semicontinuous Experimental Technique for the Study of the Influence of Mixing Conditions of the Homogeneity of Sewage Sludge 1087

N. PEITERSEN, J. MEDEIROS, and M. MANDELS: Adsorption of *Trichoderma* Cellulase on Cellulose 1091

I. SATOH, I. KARUBE, and S. SUZUKI: Enzyme Electrode for Free Cholesterol 1095

ISSUE NO. 8, AUGUST

K. YAMAMOTO, T. TOSA, K. YAMASHITA, and I. CHIBATA: Kinetics and Decay of Fumarase Activity of Immobilized *Brevibacterium ammoniagenes* Cells for Continuous Production of L-Malic Acid 1101

Y. NAKAMOTO, M. NISHIDA, I. KARUBE, and S. SUZUKI: Photocontrol of Immobilized Trypsin Activity 1115

G. R. CYSEWSKI and C. R. WILKE: Rapid Ethanol Fermentations Using Vacuum and Cell Recycle 1125

Y. ALROY and S. R. TANNENBAUM: Considerations in Predicting Phenotypic Modifications in Amino Acid Profiles of Total Cell Protein of Microorganisms 1145

Y. ALROY and S. R. TANNENBAUM: Phenotypic Modifications in Amino Acid Profiles of Cell Residues of *Candida utilis* and *Enterobacter aerogenes* 1155

P. Y. YANG: Biological Kinetic Behaviors and Operational Performances in Aerated and Oxygenated Systems 1171

I. KARUBE, S. TANAKA, T. SHIRAI, and S. SUZUKI: Hydrolysis of Cellulose in a Cellulase-Bead Fluidized Bed Reactor 1183

H. YOON, G. KLINZING, and H. W. BLANCH: Competition for Mixed Substrates by Microbial Populations 1193

Communications to the Editor

N. KELLY, A. FLYNN, and D. B. JOHNSON: Preliminary Investigations on the Immobilization of Yeast Alcohol Dehydrogenase 1211

R. M. KELLY and D. J. KIRWAN: Electrochemical Regeneration of NAD^+ on Carbon Electrodes 1215

A. LEDUY and N. THERIEN: An Improved Method for Optical Density Measurement of the Semimicroscopic Blue Green Alga *Spirulina maxima* . 1219

D. I. C. WANG and B. K. HAMILTON: Kinetics of the Enzymatic Synthesis of Peptide Antibiotics 1225

I. KARUBE, K.-I. HIRANO, and S. SUZUKI: Glucose Oxidase Pellets 1233

A. F. GAUDY, JR., S. R. GOSWAMI, T. MANICKAM, and E. GAUDY: Formation of Strippable Metabolic Products in Biological Waste Treatment 1239

D. J. FINK: Enhancement of Oxidase Reactor Productivity 1245

D. B. VAN DONGEN and D. O. COONEY: Hydrolysis of Salicin by β-Glucosidase in a Hollow Fiber Reactor 1253

Information for Contributors 1259

ISSUE NO. 9, SEPTEMBER

R. N. MUKHERJEA, P. BHATTACHARYA, B. K. GHOSH, and D. K. TARAPHDAR: Process Engineering Studies on Immobilized Trypsin Using Molecular Sieves as Carriers 1259

J.-P. LATGÉ, R. S. SOPER, and C. D. MADORE: Media Suitable for Industrial Production of *Entomophthora virulenta* Zygospores 1269

J. E. ZAJIC, H. GUIGNARD, and D. F. GERSON: Emulsifying and Surface Active Agents from *Corynebacterium hydrocarboclastus* 1285

J. E. ZAJIC, H. GUIGNARD, and D. F. GERSON: Properties and Biodegradation of a Bioemulsifier from *Corynebacterium hydrocarboclastus* 1303

T. TASSINARI and C. MACY: Differential Speed Two Roll Mill Pretreatment of Cellulosic Materials for Enzymatic Hydrolysis 1321

J. R. GUTIERREZ and L. E. ERICKSON: Hydrocarbon Uptake in Hydrocarbon Fermentations 1331

A. M. KLIBANOV, G. P. SAMOKHIN, K. MARTINEK, and I. V. BEREZIN: A New Approach to Preparative Enzymatic Synthesis 1351

W. BORZANI, R. E. GREGORI, and M. L. R. VAIRO: Some Observations on Oscillatory Changes in the Growth Rate of *Saccharomyces cerevisiae* in Aerobic Continuous Undisturbed Culture 1363

R. ARIS and A. E. HUMPHREY: Dynamics of a Chemostat in which Two Organisms Compete for a Common Substrate 1375

F. WENGENMAYER, D. LINDER, and K. WALLENFELS: 1,4-α-Glucan Phosphorylase from *Klebsiella pneumoniae* Covalently Coupled on Porous Glass 1387

Communications to the Editor

D. VENARDOS: pH-Activity Response for Immobilized β-Glucosidase 1405

Y. MIURA and K. MIYAMOTO: Oxygen Transfer within Fungal Pellets 1407

S. P. P. OTTENGRAF: Theoretical Model for a Submerged Biological Filter 1411

P. A. JENNINGS: Reply to "Theoretical Model for a Submerged Biological Filter" 1417

ISSUE NO. 10, OCTOBER

R. DATTA, L. FRIES, and G. T. WILDMAN: Concentration of Antibiotics by Reverse Osmosis 1419

L. M. CHASE: A Dynamic Kinetic Model of the Activated Sludge Process . 1431

C. L. COONEY and F. ACEVEDO: Theoretical Conversion Yields for Penicillin Synthesis 1449

L. F. CHEN and G. T. TSAO: Chemical Procedures for Enzyme Immobilization on Porous Cellulose Beads 1463

H. OLEM and R. F. UNZ: Acid Mine Drainage Treatment with Rotating Biological Contactors 1475

I. KARUBE, Y. YUGETA, and S. SUZUKI: Electric Field Control of Lipase Membrane Activity 1493

C. S. HO, L. E. ERICKSON, and L. T. FAN: Modeling and Simulation of Oxygen Transfer in Airlift Fermentors 1503

J. REHACEK and J. SCHAEFER: Disintegration of Microorganisms in an Industrial Horizontal Mill of Novel Design 1523

I. KARUBE, T. MATSUNAGA, S. MITSUDA, and S. SUZUKI: Microbial Electrode BOD Sensors 1535

Communications to the Editor

I. KARUBE, S. SUZUKI, Y. NAKAMOTO, and M. NISHIDA: Photocontrol of Trypsin Inhibition with Immobilized Inhibitor 1549

J. VORTRUBA, M. SOBOTKA, and A. PROKOP: Evaluation of Aeration Capacity from Cultivation Data Files: Application to Large-Scale Fermentations 1553

A. MIZRAHI: Primatone RL in Mammalian Cell Culture Media 1557

ISSUE NO. 11, NOVEMBER

K. YAMADA: Recent Advances in Industrial Fermentation in Japan (*Bioengineering Report*) 1563

Z. HUNKOVÁ and Z. FENCL: Toxic Effects of Fatty Acids on Yeast Cells: Dependence of Inhibitory Effects on Fatty Acid Concentration 1623

B. MATTIASSON, K. MOSBACH, and A. SVENSON: Application of Cyanide-Metabolizing Enzymes to Environmental Control; Enzyme Thermistor Assay of Cyanide Using Immobilized Rhodanese and Injectase 1643

A. LEDUY, N. KOSARIC, and J. E. ZAJIC: Transfer Function Matrix of the Continuous Cultivation System of *Morchella crassipes* in Ammonia Base Waste Sulfite Liquor 1653

W. HALWACHS, C. WANDREY, and K. SCHÜGERL: Application of Immobilized Chymotrypsin in a Multistage Fluidized-Bed Reactor 1667

F. JÜTTNER: Thirty Liter Tower-Type Pilot Plant for the Mass Cultivation of Light- and Motion-Sensitive Planktonic Algae 1679

V. S. O'LEARY, C. SUTTON, M. BENCIVENGO, B. SULLIVAN, and V. H. HOLSINGER: Influence of Lactose Hydrolysis and Solids Concentration on Alcohol Production by Yeast in Acid Whey Ultrafiltrate 1689

A. KILARA, K. M. SHAHANI, and F. W. WAGNER: Preparation and Properties of Immobilized Papain and Lipase 1703

Communications to the Editor

S. J. SWANSON, A. EMERY, and H. C. LIM: Kinetics of Maltose Hydrolysis by Glucoamylase 1715

A. M. MADGAVKAR, Y. T. SHAH, and J. T. COBB: Hydrolysis of Starch in a Membrane Reactor 1719

I. KARUBE, T. MATSUNAGA, S. TSURU, and S. SUZUKI: Biochemical Fuel Cell Utilizing Immobilized Cells of *Clostridium butyricum* 1727

R. E. SPIER, J. P. WHITESIDE, and K. BOLT: Trypsinization of BHK 21 Monolayer Cells Grown in Two Large-Scale Unit Process Systems 1735

ISSUE NO. 12, DECEMBER

J. J. MARSHALL and J. D. HUMPHREYS: Synthesis of a Soluble Catalase–Dextran Conjugate 1739

R. K. BAJPAI, D. RAMKRISHNA, and A. PROKOP: Effect of Drop Interactions on the Performance of Hydrocarbon Fermentors 1761

K. F. NGIAN, S. H. LIN, and W. R. B. MARTIN: Effect of Mass Transfer Resistance on the Lineweaver–Burk Plots for Flocculating Microorganisms 1773

A. K. CHEN and C. C. LIU: Electrochemical Evaluation of Lactate Dehydrogenase Immobilized in Polyacrylamide Gels 1785

F. M. MALLEE and H. W. BLANCH: Mechanistic Model for Microbial Growth on Hydrocarbons 1793

G. A. GRANT, A. W. ANDERSON, and Y. W. HAN: Preliminary Cost Estimates for Commercial Fermentation of Straw as Animal Feed 1817

M. NIHTILÄ and J. VIRKKUNEN: Practical Identifiability of Growth and Substrate Consumption Models 1831

H. MÄRKL: CO_2 Transport and Photosynthetic Productivity of a Continuous Culture of Algae 1851

C. LALUCE and R. MOLINARI: Selection of a Chemically Defined Medium for Submerged Cultivation of *Streptomyces aureofaciens* with High Extracellular Caseinolytic Activity 1863

Communications to the Editor

J. C. MERCHUK: Further Considerations on the Enhancement Factor for Oxygen Absorption into Fermentation Broth 1885

O. VELICANGIL and J. A. HOWELL: Protease-Coupled Membranes for Ultrafiltration 1891

J. W. FINLEY, W. L. STANLEY, and G. G. WATTERS: Removal of Chill Haze from Beer with Papain Immobilized on Chitin 1895

Erratum

Y. ALROY and S. R. TANNENBAUM: Considerations in Predicting Phenotypic Modifications in Amino Acid Profiles of Total Cell Protein of Microorganisms 1899

Author Index 1901

Subject Index 1911

Acknowledgments 1913

Volume Title Page i

Volume Contents iii